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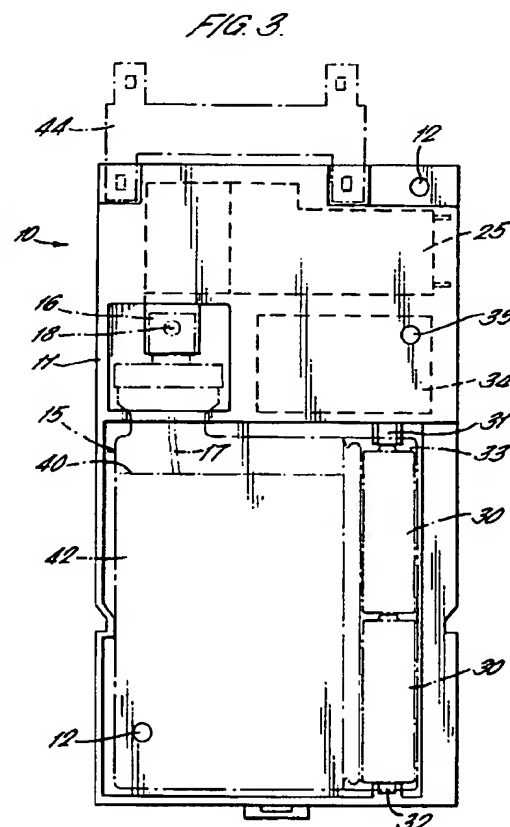
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(54) **Apparatus for discharging material from a container and container therefor.**

(57) The invention provides apparatus comprising a housing (10) for retaining in position a replaceable container (15) having a reciprocable button (16) for discharging material from the container through an outlet nozzle (18) in the button. Means (19) are provided for at least depressing the discharge button (16) actuated by a battery operated electric motor. The container and battery or batteries for operating the electric motor are combined as a unit.

The invention also provides a container (15) for the apparatus comprising a receptacle (42) for the material to be discharged, and an outlet (43) in the receptacle for receiving a reciprocable button (16) for discharging material from the receptacle through an outlet nozzle (18) in the button. A separate compartment (33) in the container is provided for receiving the battery or batteries (30) required, the compartment having means (36, 37) allowing the battery or batteries, in use, to engage electrical contacts (31, 32) within the apparatus intended to receive the container (15).



This invention relates to apparatus for discharging material from a container, and to containers therefor. More particularly but not exclusively, the invention relates to air freshener apparatus in which the container is filled with air freshening material which may be discharged into the atmosphere at predetermined intervals.

In bathroom and toilet facilities in offices, public places, domestic homes, it is known to install an air freshener apparatus. Conveniently the apparatus is wall mounted, and employs an electric motor to depress a button to open a release valve thereby allowing a measured amount of air freshening fluid to be discharged from a pressurised container. The motor may be timed to operate at predetermined intervals. The container also contains a propellant which up to now has been a CSC gas or a hydrocarbon gas, both of which may be deemed environmentally unacceptable or a danger to health if misused.

Therefore, instead of the discharge button opening a release valve, the button may be associated with a dose pump for pumping a metered amount of the material from the bottom of the container to the outlet nozzle in the button. Use of a propellant is thereby avoided.

It is also known to discharge other materials, e.g. liquid soap, from containers in a similar manner.

According to the invention there is provided apparatus comprising a housing for retaining in position a replaceable container having a reciprocable button for discharging material from the container through an outlet nozzle in the button, and means for at least depressing the discharge button actuated by a battery operated electric motor, characterised in that the container and battery or batteries for operating the electric motor are combined as a unit.

This means that the container and battery or batteries are adapted to be removed together from the apparatus when the container is empty, and replaced by a new unit comprising a full container and an unused battery or batteries.

Preferably the container defines a battery compartment for receiving the battery or batteries required and for aligning the battery or batteries so that when the combined unit is fitted into the apparatus, the battery or batteries engage electrical contacts connected to the electric motor.

In one embodiment of the invention, the discharge button includes a dose pump for drawing the material from within the container to the outlet nozzle.

In the case of the apparatus being an air freshener, the container is filled with air freshening material. Preferably timing means are provided for controlling the electric motor to be switched on at predetermined intervals.

It is also preferred that the reciprocable button is depressed and returned by means which are operated by one revolution of the output shaft of the electric

motor, which shaft carries a cam associated with a microswitch which stops the motor when the shaft has rotated through said one revolution.

The apparatus preferably includes control means for controlling the operation of the electric motor, which control means act as a relay to bridge the microswitch to allow the electric motor to start in accordance with the timing means.

The timing means can preferably be varied to alter the predetermined intervals at which the electric motor is switched on.

It is also preferred that, for test purposes, means are provided which allow the electric motor to be triggered to operate through one cycle.

The invention also provides a container for apparatus as defined above, comprising a receptacle for the material to be discharged, an outlet in the receptacle for receiving a reciprocable button for discharging material from the receptacle through an outlet nozzle in the button, and a separate compartment for receiving the battery or batteries required, the compartment having means allowing the battery or batteries, in use, to engage electrical contacts within the apparatus intended to receive the container.

Preferably the battery compartment has opposed slots to enable the container to slide into position in the apparatus with the electrical contacts protruding through the slots into the compartment.

Before use, it is preferred that the receptacle is filled with the material to be discharged and a reciprocable discharge button is sealed into the outlet, and the compartment contains the required battery or batteries.

In a preferred embodiment, the material is air freshening material.

The discharge button preferably includes a dose pump for drawing the material from the receptacle to the outlet nozzle.

By way of example, a specific embodiment in accordance with the invention will be described with reference to the accompanying drawings in which:-

Figure 1 is a perspective view of the housing of apparatus for discharging air freshening material into the atmosphere;

Figure 2 shows an exploded view of a container and battery unit to be inserted into the housing of the apparatus of Figure 1;

Figure 3 shows the wall-mounted part of the housing of the apparatus of Figure 1 with the container and battery unit of Figure 2 slid therein;

Figure 4 shows the plunger for depressing the discharge button of the container of Figure 2 and the motor drive for operating the plunger, in exploded view; and

Figure 5 is a rear view of the wall-mounted part of the housing showing the motor drive to the plunger contained therein, in exploded view.

This example concerns an air freshening appara-

tus which is suitable for use in bathroom/toilet facilities in offices or other business premises, hotels or the like, including domestic premises.

Referring to the drawings, the apparatus comprises a housing 10 having a rear part 11 suitable for being wall-mounted by screw holes 12, and to which a cover 13 is hinged by a nylon hinge 44. The cover 13 is held closed in this embodiment by a key releasable catch 14. In the lower part of the housing there is housed a plastic moulded container 15 having a receptacle portion 42 for receiving air freshening material which in this embodiment is mixed with a desired perfume and a detergent acting as a preservative. Crimped or otherwise sealed into a top outlet 43 of the receptacle 42 is a reciprocable discharge button 16 including a known type of dose pump interconnecting a dip tube 17 depending to the bottom of the receptacle and an outlet nozzle 18. The discharge button 16 has a D-shaped cross-section for contact by an angle shaped plunger 19 which both depresses the button and maintains the alignment of the outlet nozzle 18 relative to an aperture 41 in the housing through which, in use, the air freshening material is discharged into the atmosphere.

The plunger 19 is part of a slider plate 20 located for up and down movement in guides 21 and having a transverse slot 22. Fitting within the slot 22 is a collar 23 eccentrically mounted on a cam 27, which is itself carried on the output shaft 24 of an electric motor 25 and gear box 26. One revolution of the shaft 24 will thereby effect one reciprocatory cycle of the plunger 19 which successively downwardly depresses and upwardly returns the discharge button 16. On the periphery of the cam 27 is a ridge or high point 28 which closes a microswitch 29 to switch off the electric motor 25.

Power to the electric motor 25 is supplied by two batteries 30 received vertically in a compartment 33 of the container 15 which in this embodiment is disposed along one upright edge of the receptacle 42. The batteries 30 engage upper and lower contacts 31, 32 respectively which are electrically connected to the control board 34 for the electric motor 25. The compartment 33 has a casing 35 which clips or is otherwise secured to the adjacent side edge of the receptacle 42 of the container 15, and the casing has slots 36, 37 in its two ends through which the contacts 31, 32 project when the container 15 is inserted into the apparatus. The container 15 and batteries 30 in the compartment 33 of the container thereby comprise a unit which is inserted into the housing of the apparatus and can be replaced when the container is empty or as desired, as a single item.

The control board 34 and electric motor 25 are housed above the container 15 and battery 30 unit, and protected by a cover plate 38 which may be permanently sealed in position. The contact board is live when the batteries 30 are present and includes timing

means which are present to switch on the electric motor 25 at predetermined intervals, e.g every 20 minutes, but which may be varied to operate at other intervals between 5 minutes and 1 hour. When switching on the electric motor 25, the control means also acts as a relay to bridge the microswitch 29 which is then closed, but which opens when the cam 27 begins to rotate through its one revolution of the operating cycle.

An aperture 39 allows a test probe to be inserted to operate the electric motor 25 through one cycle, bypassing the timing means, and to show that the apparatus is operative.

In operation, with the cover 12 open, a new container 15 and battery 30 unit is slid into the apparatus, the slots 36, 37 encompassing the battery contacts 31, 32. The battery contacts 31, 32 thereby protrude through the slots 36, 37 into contact with the batteries 30, and the discharge button 16 is positioned beneath the plunger 19. If desired, a test probe (not shown) may be inserted in the aperture 39 to check that the electric motor 25 will switch on. The cover 13 is then closed.

Under the control of the timing means, at each predetermined interval, the electric motor 25 will be switched on and its output shaft 24 will rotate to reciprocate the plunger 19 and thereby the button 16. This will cause an amount of air freshening material 40 measured by the pump to be discharged through the aperture 41 into the atmosphere. At the end of one revolution of the shaft 24, the high point 28 on the cam 27 will close the microswitch 29 and switch off the electric motor 25. This operating cycle will be repeated at the intervals set by the timing means. When the container is empty, or as desired, the container and battery unit is replaced by a new unit comprising a full receptacle 42 and unused batteries 30. This system thus effectively prevents failure of the apparatus due to insufficient power remaining in the batteries.

The invention is not limited to the specific details of the example described above. For example, the principle of the replacement unit of a container 15 and the required battery or batteries 30 may be applied to containers which rely on a propellant to discharge the material therefrom.

Similarly, the receptacle portion 42 of the container 15 may be filled with material other than an air freshening mixture, for example, liquid soap.

## Claims

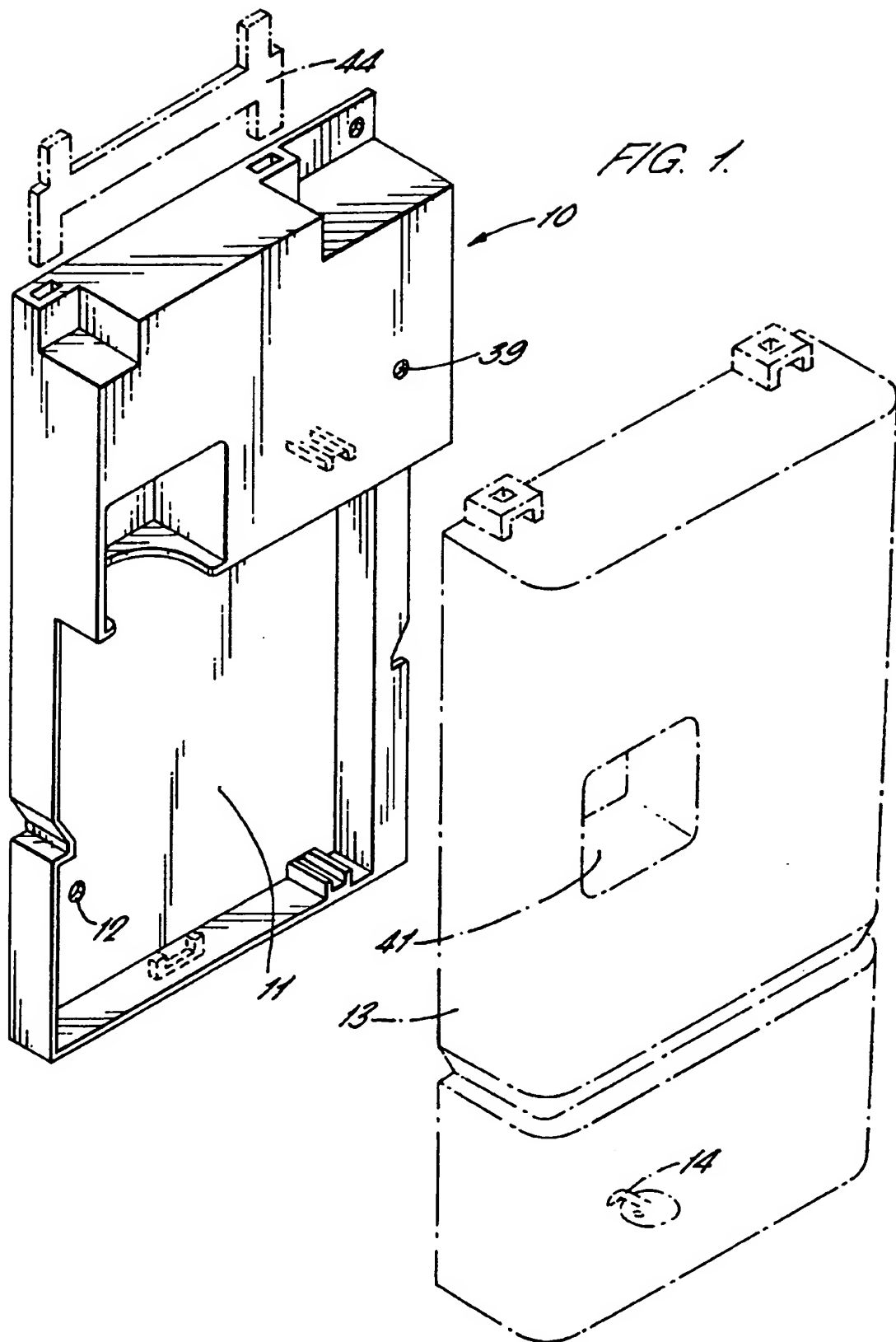
1. Apparatus comprising a housing (10) for retaining in position a replaceable container (15) having a reciprocable button (16) for discharging material from the container through an outlet nozzle (18) in the button, and means (19) for at least depressing the discharge button actuated by a battery op-

erated electric motor (25), characterised in that the container and battery or batteries (30) for operating the electric motor are combined as a unit.

2. Apparatus as claimed in Claim 1, characterised in that the container (15) defines a battery compartment (33) for receiving the battery or batteries (30) required and for aligning the battery or batteries so that when the combined unit is fitted into the apparatus, the battery or batteries engage electrical contacts (31, 32) connected to the electric motor (25). 5
3. Apparatus as claimed in Claim 1 or Claim 2, characterised in that the discharge button (16) includes a dose pump for drawing the material from within the container (15) to the outlet nozzle (18). 10
4. Apparatus as claimed in any one of the preceding claims, characterised in that the apparatus is an air freshener, the container (15) being filled with air freshening material. 15
5. Apparatus as claimed in Claim 4, characterised in that timing means are provided for controlling the electric motor (25) to be switched on at predetermined intervals. 20
6. Apparatus as claimed in Claim 5, characterised in that the reciprocable button (16) is depressed and returned by means (19) which are operated by one revolution of the output shaft (24) of the electric motor (25), which shaft carries a cam (27) associated with a microswitch (29) which stops the motor when the shaft has rotated through said one revolution. 25
7. Apparatus as claimed in Claim 6, characterised in that control means are provided for controlling the operation of the electric motor (25), which control means act as a relay to bridge the microswitch (29) to allow the electric motor to start in accordance with the timing means. 30
8. Apparatus as claimed in any one of Claims 5 to 7, characterised in that the timing means can be varied to alter the predetermined intervals at which the electric motor (25) is switched on. 35
9. Apparatus as claimed in any one of the preceding claims, characterised in that, for test purposes, means (39) are provided which allow the electric motor (25) to be triggered to operate through one cycle. 40
10. A container for apparatus as claimed in Claim 1, comprising a receptacle (42) for the material to be discharged, and an outlet (43) in the receptacle 45

for receiving a reciprocable button (16) for discharging material from the receptacle through an outlet nozzle (18) in the button, characterised in that a separate compartment (33) is provided for receiving the battery or batteries (30) required, the compartment having means (36, 37) allowing the battery or batteries, in use, to engage electrical contacts (31, 32) within the apparatus intended to receive the container (15).

11. A container as claimed in Claim 10, characterised in that the battery compartment (33) has opposed slots (36, 37) to enable the container (15) to slide into position in the apparatus with the electrical contacts (31, 32) protruding through the slots into the compartment. 50
12. A container as claimed in Claim 10 or Claim 11, characterised in that the receptacle (42) is filled with the material to be discharged and a reciprocable discharge button (16) is sealed into the outlet (43), and the compartment (33) contains the required battery or batteries (30). 55
13. A container as claimed in Claim 12, characterised in that the material is air freshening material. 60
14. A container as claimed in Claim 12 or Claim 13, characterised in that the discharge button (16) includes a dose pump for drawing the material from the receptacle (42) to the outlet nozzle (18). 65



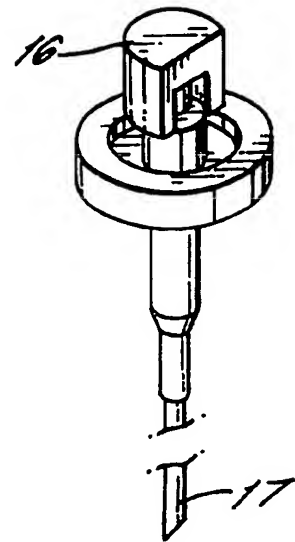


FIG. 2.

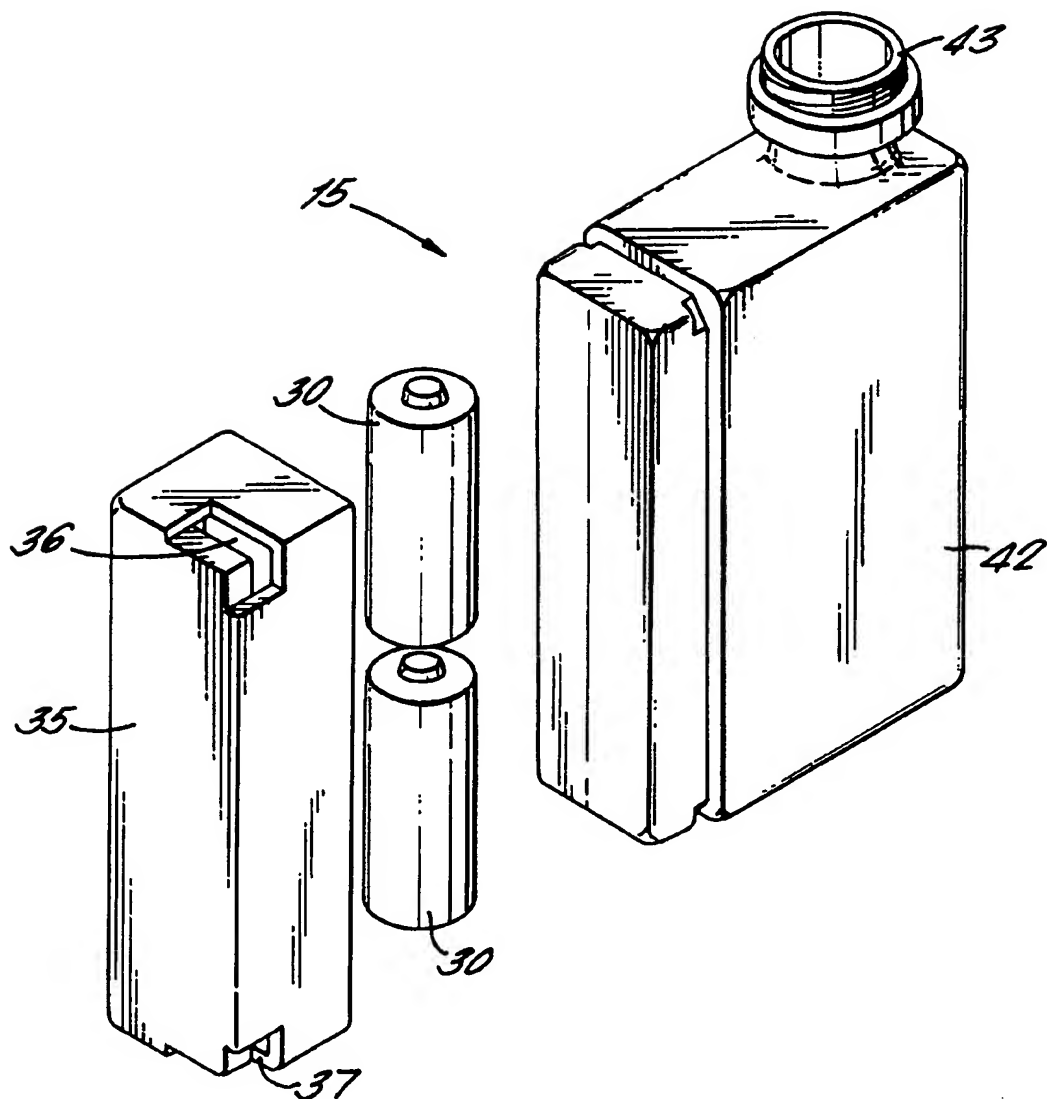
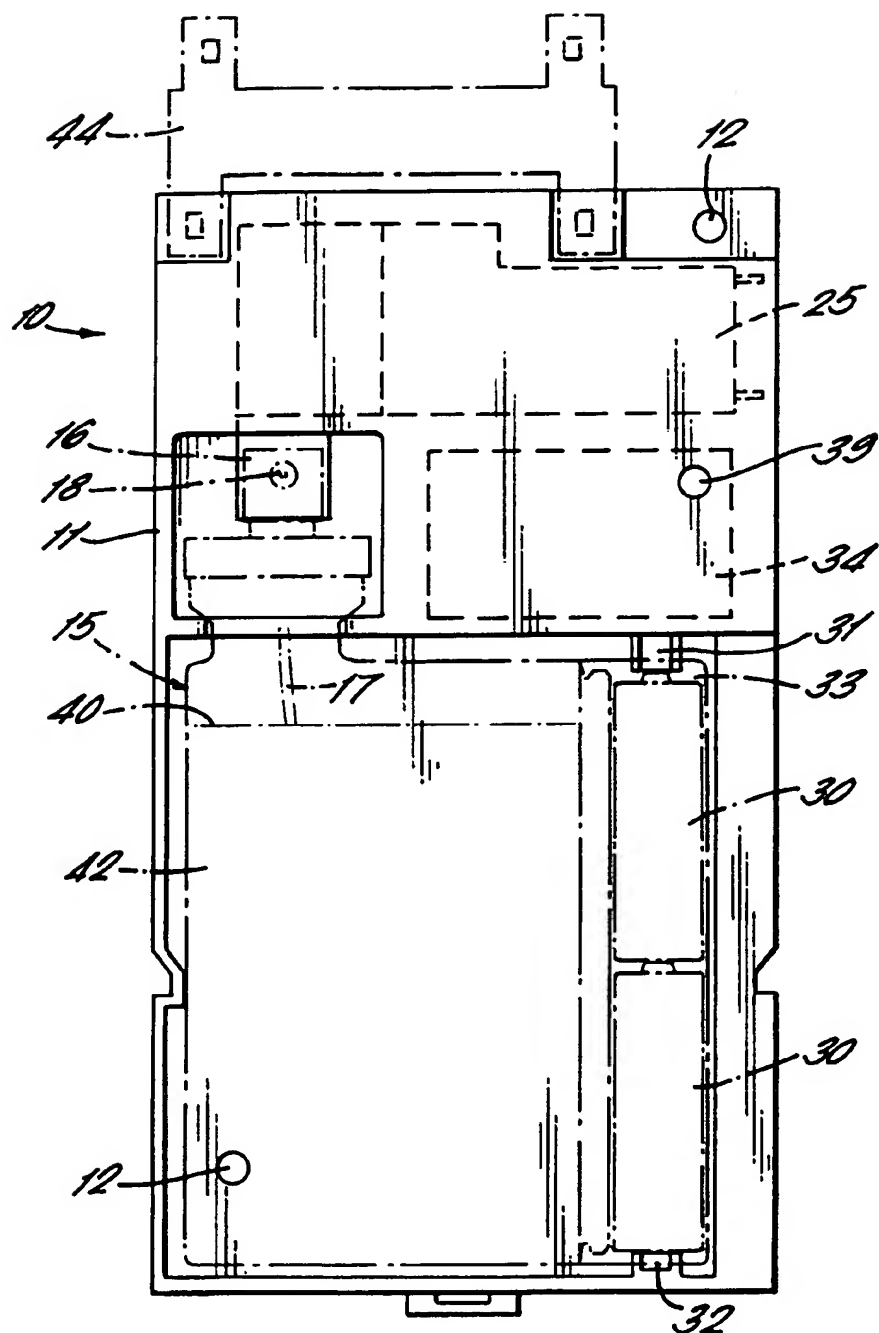
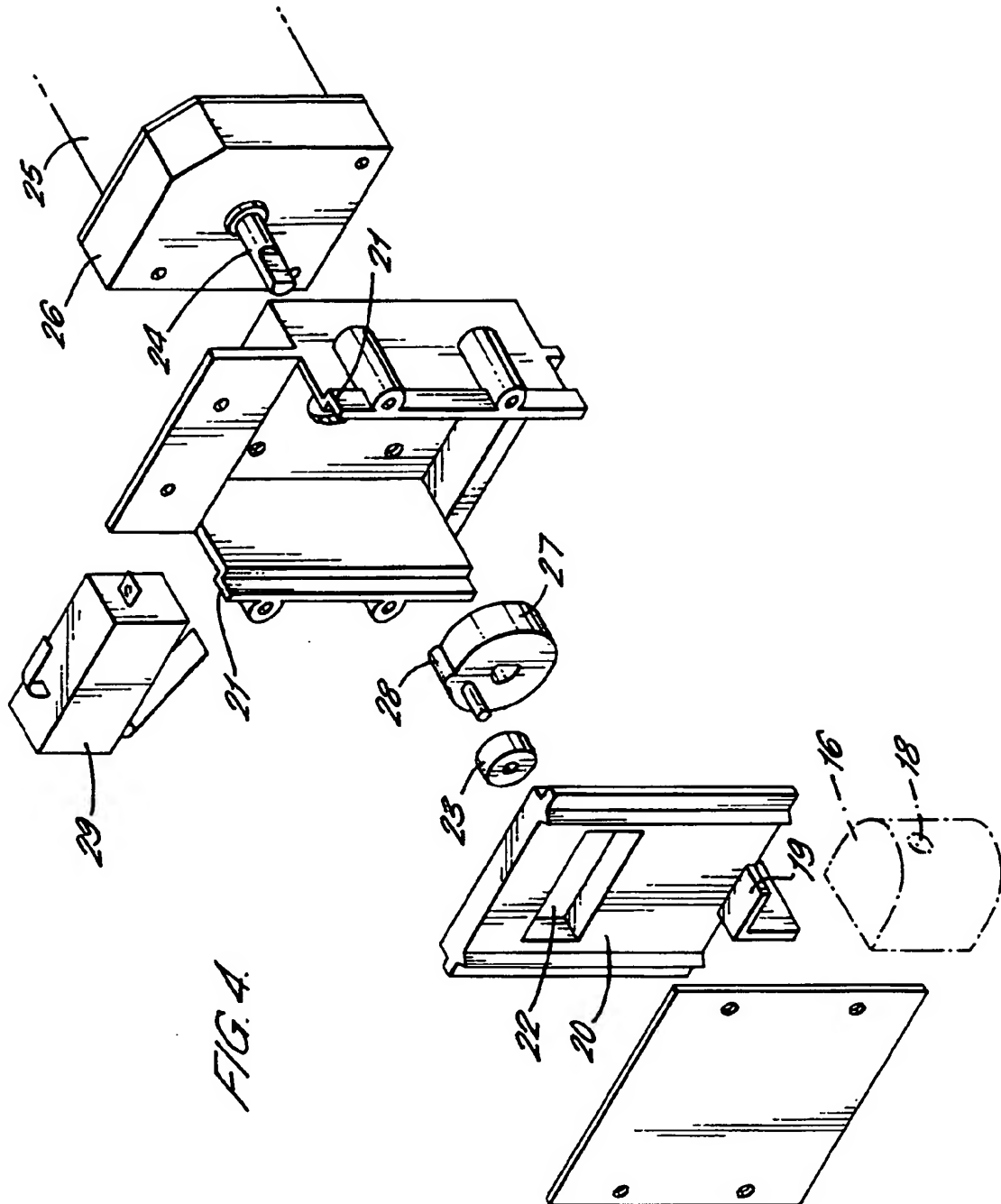
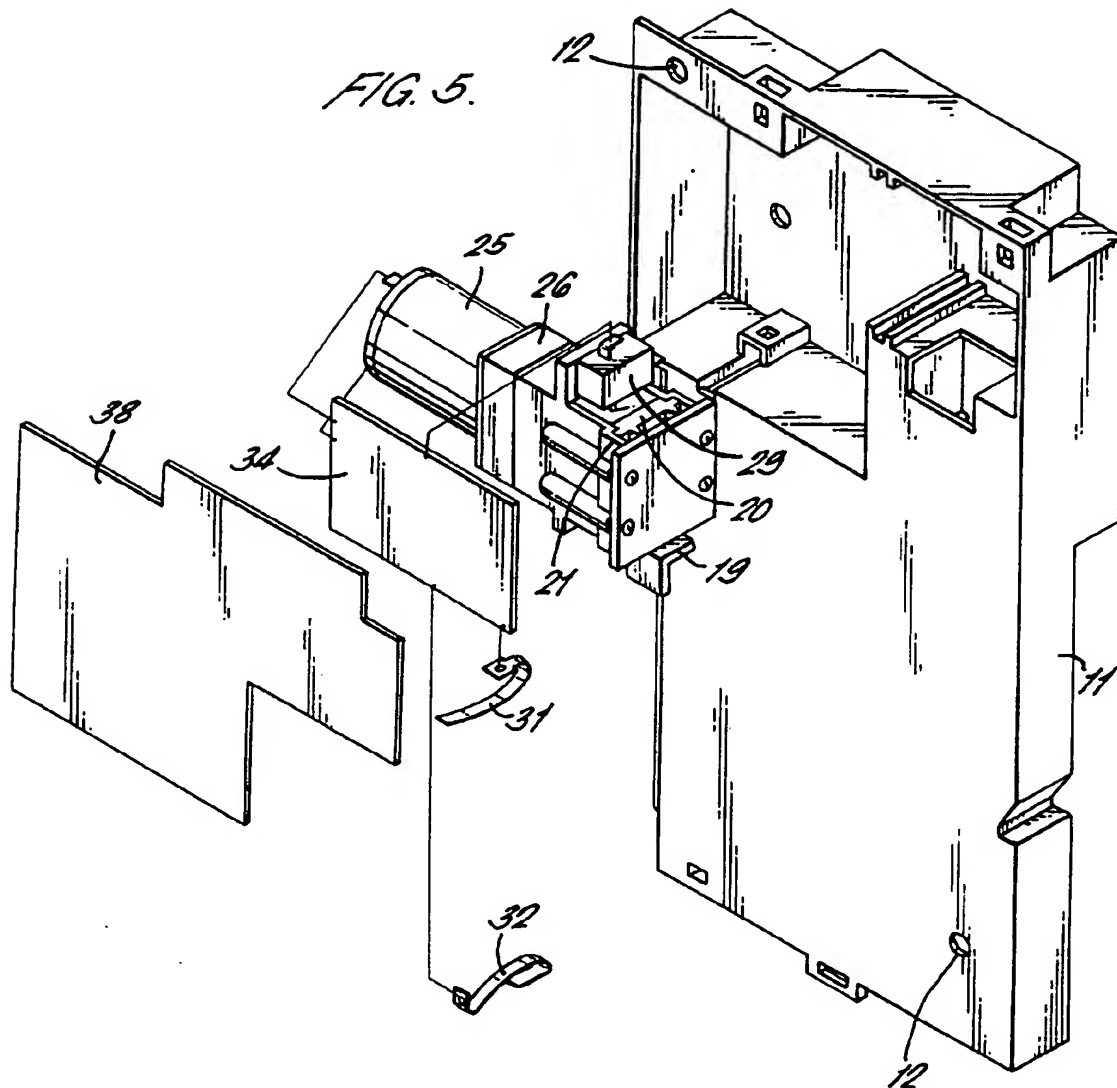


FIG. 3.











European Patent  
Office

# EUROPEAN SEARCH REPORT

Application Number

EP 92 30 3721

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl.5)
A	DE-A-3 518 500 (SZPERKOWSKI)  * the whole document * ---	1, 3, 5, 10, 14	B65D83/26
A	US-A-3 726 437 (SIEGEL) * the whole document * -----	1, 5-8, 10	
			TECHNICAL FIELDS SEARCHED (Int. Cl.5)
			B65D B05B
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 20 JULY 1992	Examiner LEONG, C. Y.
<p><b>CATEGORY OF CITED DOCUMENTS</b></p> <p>X : particularly relevant if taken alone  Y : particularly relevant if combined with another document of the same category  A : technological background  O : non-written disclosure  P : intermediate document</p> <p>T : theory or principle underlying the invention  E : earlier patent document, but published on, or after the filing date  D : document cited in the application  L : document cited for other reasons</p> <p>.....  &amp; : member of the same patent family, corresponding document</p>			

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